1. SCOPE:

1.1 Title: Globe, Globe Angle, and Globe Stop Check Valves; repair

2. REFERENCES:

a. S9253-AD-MMM-010, Volume 1, Maintenance Manual for Valves, Traps, and Orifices (Non-Nuclear), User's Guide and General Information.

3. REQUIREMENTS:

3.1 Matchmark valve parts.

(V) "INSPECT PARTS FOR DEFECTS"

3.2 Disassemble, clean internal and external surfaces free of foreign matter (including paint), and inspect parts for defects.

3.3 Repair valve as follows:

3.3.1 Straighten stem to within 0.002 inch total indicator reading. Polish stem to a 32 Root-Mean-Square (RMS) finish in way of packing surface and remove raised edges and foreign matter.

3.3.2 Chase and tap exposed threaded areas.

3.3.3 Dress and true gasket mating surfaces.

3.3.4 Machine, grind, or lap and spot-in disc to seat to obtain a 360-degree continuous contact.

(V)(G) "INSPECT CONTACT"

3.3.4.1 Inspect contact using blueing method (soft seated valves excluded). Transfer line (hard seated valves) shall not exceed 1/16 inch in width.

(I)(G) "VERIFY LEVEL I PARTS" (See 4.3)

3.4 Assemble valve installing new gaskets in accordance with manufacturer's specifications, and fasteners in accordance with Table One, or Table 2 for DDG 51 class.

3.4.1 Install new valve stem packing conforming to MIL-P-24503 and MIL-P-24583 in accordance with Chapter 6 of 2.a.

3.4.1.1 Valve stem clearances that are not within the prescribed tolerances of Table 6-7 of 2.a shall be packed with valve stem packing conforming to MIL-P-17303, Class II, Type E, Symbol 1111 for temperatures greater than 500 degrees Fahrenheit and with valve stem packing conforming to MIL-P-24377 for temperatures 500 degrees Fahrenheit or less.

3.4.2 Pack valves of systems other than feedwater, condensate, or steam with valve packing conforming to MIL-P-24396, Type B.

3.5 Hydrostatically test valve as follows:

3.5.1 Hydrostatic test equipment shall have the following capabilities:

3.5.1.1 Manual overpressure protection release valve.

3.5.1.2 Self-actuated and resetting relief valve with a set point no greater than 100 PSIG above the test pressure or 10 percent above the test pressure, whichever is less.

3.5.1.3 Master and backup test gages with gage range and graduation shown on Table 3.

3.5.1.4 Protection equipment shall be accessible and test gages shall be located where clearly visible and readable to pump operator and inspector.

(V)(G) or (I)(G) "SEAT TIGHTNESS" (See 4.4)

3.5.2 Test for seat tightness in the direction tending to open valve.

3.5.2.1 Do not exceed the handwheel closing force specified in Table 4.

3.5.2.2 Test shall be continued for a minimum of three minutes if there is no evidence of leakage, or in the event of visible leakage, until accurate determination of leakage can be made. Maximum allowable leakage: 10 cubic centimeters (cc) per hour, per inch of nominal pipe size. Valve sizes one inch or less may be 10 cc maximum per hour.

(V)(G) or (I)(G) "SEAT TIGHTNESS" (See 4.4)

3.5.3 Back pressure test globe stop check valve with stem in the open position. Allowable leakage as follows:

VALVE SIZE (NOM)	LEAKAGE RATE
Up to 2 inches inclusive	25 cc/hr./in. dia.
2-1/2 inches - 10 inches inclusive	50 cc/hr./in. dia.
Over 10 inches	100 cc/hr./in. dia.

The back pressure applied shall be in accordance with the following:

VALVE PRESSURE RATING	TEST BACK PRESSURE
150 PSIG and Below	50 PSIG
Over 150 PSIG	100 PSIG

4. NOTES:

4.1 The test pressures of 3.5.2 will be specified in the invoking Work Item.

4.2 Repair of valve operating gear will be specified in the invoking Work Item.

4.3 The paragraph referencing this note is considered an (I)(G) if the valve is Level I and QA Form 2, NON-NUCLEAR MATERIAL ID/CONTROL TAG is required. QA Form for objective quality evidence (OQE) is not required.

4.4 The paragraph referencing this note is considered an (I)(G) if the valve is Level I. If the valve is not Level I, the paragraph is considered a (V)(G).

TABLE ONE

VALVE BODY MATERIAL

	1/ Alloy Steel	Carbon Steel	2/ Nonferrous
3/ Studs and Bolts to MIL-***DTL***-1222	Grade B-16	Grade B-16	Phosphor Bronze - Any Grade Silicon Bronze - Any Grade Nickel Copper - Class A 4/
Nuts to MIL-***DTL***-1222	Grade 4 or 7	Grade 4 or 7	Phosphor Bronze - Any Grade Silicon Bronze - Any Grade Nickel Copper - Class A or Class B 5/
Socket Head Cap Screws	FF-S-86	FF-S-86	

NOTES:

1/ Alloy steel is of Composition A - 2-1/4 percent Chromium, one percent Molybdenum, Composition B - 1-1/4 percent Chromium, 1/2 percent Molybdenum, and Composition C - Carbon Molybdenum.

2/ Nonferrous Alloy except Aluminum.

3/ Studs shall be Class 2 or 3 fit on the nut end and Class 5 fit on the stud end, except that a Class 3 fit with a thread locking compound may be used where temperatures do not exceed 250 degrees Fahrenheit. The thread locking compound shall conform to MIL-S-22473. Inspect Class 3 fit stud ends in accordance with SAE-J2270.

4/ Fasteners of Nickel Copper Aluminum Alloy shall be the only type used on sea chests and hull valves.

5/ Nuts of Nickel Copper Alloy, conforming to QQ-N-281 Class A or B, or Nickel Copper Aluminum Alloy conforming to QQ-N-286 shall be the only type used on sea chests and hull valves.

TABLE 2

VALVE BODY MATERIAL

	1/ Alloy Steel/Carbon Steel	2/ Nonferrous
3/ Studs and Bolts to MIL-***DTL***-1222	5/ For services up to and including 650 degree Fahrenheit (F); Grade 5 steel	4/ 5/ Phosphor Bronze - Any Grade Silicon Bronze - Any Grade Nickel Copper - Class A
	For services in 1,000 degrees F; grade B-16	
	For services to 775 degrees F; Grade B-16	
	For services in which JP-5, lubricating oil, or inflammable gas or liquid of any kind, regardless of pressure and temperature, which are within 3 feet of hot surfaces (above 650 degrees F) and where steel tubing is required; Grade 2, 5 or 8 steel	
	Bolting subject to sea water corrosion (other than hull integrity bolting; for hull integrity bolting see Note 4) Connections in contact with bilge regions. Where strength requires ferrous bolting and is exposed to the weather; Class A Nickel-Copper alloy to QQ-N-281 or silicon bronze to ASTM B98 with dimensions of MIL-***DTL***-1222. Where greater strength is required, use Nickel-Copper-Aluminum alloy QQ-N-286.	
Nuts to MIL-***DTL***-1222	5/ For services up to and including 650 degrees F; Grade 5 steel	Phosphor Bronze - Any Grade Silicon Bronze - Class A or Class B 4/ 5/
	For services to 775 degrees F; Grade 2H or 4 steel	
	For services to 1,000 degrees F; Grade 4 steel	
	For services in which JP-5, lubricating oil, or inflammable gas or liquid of any kind, regardless of pressure and temperature which are within 3 feet of hot surfaces (above 650 degrees F) and where steel tubing is required; Grade 5 or 8 steel	
	Nuts subject to seawater corrosion. Connections in the bilge regions. Where strength requires ferrous material and is exposed to the weather; Class A or B Nickel-Copper alloy to QQ-N-281 or Silicon Bronze to ASTM B98 with dimensions to MIL-***DTL***-1222.	

TABLE 2 (CONTINUED)

NOTES:

1/ Alloy steel is of Composition A - 2-1/4 percent Chromium, one percent Molybdenum, Composition B - 1-1/4 percent Chromium, 1/2 percent Molybdenum, and Composition C - Carbon Molybdenum.

2/ Nonferrous Alloy except Aluminum.

3/ Studs shall be Class 2 or 3 fit on the nut end Class 5 fit on the stud end except that a Class 3 fit with a thread-locking compound may be used where temperatures do not exceed 200 degrees Fahrenheit. The thread-locking compound shall be in accordance with MIL-S-22473. Inspect Class 3 fit stud ends in accordance with SAE-J2270.

4/ Fasteners of nickel copper alloy shall be the only type used on sea chests and hull valves.

5/ Where these materials would constitute part of a galvanic couple, proposals for alternate materials shall be submitted for approval.

TABLE 3

MASTER GAGE SELECTION FOR HYDROSTATIC TESTS

Maximum Test Pressure (lb/in^2g)		Master Gage Range*** (lb/in^2g)		Master Gage Maximum Graduation Size (lb/in^2g)
From*	To**	From	To	
5000	9500	0	10000	100
3000	5800	0	6000	30
2500	4800	0	5000	30
1500	2800	0	3000	20
1000	1800	0	2000	15
750	1300	0	1500	10
500	800	0	1000	10
250	500	0	600	5
150	250	0	300	2
100	175	0	200	2
75	125	0	160	1
50	80	0	100	1
20	50	0	60	0.5
10	25	0	30	0.2
7	10	0	15	0.1
5	7	0	10	0.1

NOTES:

1. Master gage and back-up gages shall be track within two percent of each other.

2. System maximum test pressure shall be determined by applicable overhaul specification, building specification, or other governing documents.

* Values agree with the requirement that gage range shall not exceed 200 percent of maximum test pressure except for gage ranges 0 to 60 and below.

** Valves allow for reading pressures up to relief valve setting.

*** Exceptions to the values given in this table may be approved locally by design, based on an evaluation of test pressure, gage range, and specific application.

TABLE 4

HANDWHEEL CLOSING FORCE

Handwheel Diameter (Inches)	Total Tangential Force on Rim or Handwheel (Pounds)	Total Torque on Handwheel Nut (Foot Pounds)
2 and below	90	7
3	98	12
4	***106***	16
5	112	23
6	118	29
7	121	35
8	124	41
9	127	47
10	130	54
11	133	60
12	135	67
14	138	80
16	141	94
18	144	108
21	147	128
24	150	150
27	150	168
30	150	187
36	150	225